

**ANALYSIS OF EXISTING METHODOLOGICAL APPROACHES IN  
ASSESSING THE QUALITY OF THE ENVIRONMENTAL CONDITION  
OF CITIES.**

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**Abstract:** In this article, the approaches to the assessment of the environmental condition of cities, their advantages, and disadvantages, as well as the new directions that may arise on their basis, especially the advantages of the problem-complex approach in the study of the territory, are highlighted.

**Keywords:** ecological condition, quality of air, urban areas, maximum allowance rate concentration of pollutants (MAR), techno-ecological, problem-complex approach.

**Introduction.** The quality of the environment is largely determined by its ecological status. To describe the environmental condition of the area, it is necessary to have a certain number of specific indicators. Two groups of factors can be distinguished that describe the ecological situation of an area in terms of its impact on the population. The first assesses the natural conditions of the area and determines the comfort level of the natural environment for the life of the population. The second describes the level of environmental damage and pollution as a result of anthropogenic influence. This article briefly discusses the analysis of approaches to the assessment of the environmental condition of cities.

**Main part.** Assessment of the comfort of natural conditions is related to the analysis of more than 30 parameters of the natural environment, more than 10 of which are related to climatic factors, and the rest describe the relief, geological

structure, surface and underground water, flora and fauna, and the presence of natural conditions of diseases in the region.

The level of environmental pollution can be characterized by various plan indicators. The traditional method of evaluation is the use of parameters of permissible maximum allowance rate concentration of pollutants (MAR) as benchmarks. A complete assessment of pollution in different forms can be achieved by summing up the reduced MAR values of all substances.

The study of areas of different sizes should be carried out based on the analysis of pollution data obtained from the same deployed monitoring network. Such networks do not exist in many countries, and data on the level of pollution are used to calculate emission values using simple calculation methods, using statistics from the State Statistics Committee and statistics from the Ministry of Water Resources. The variety of interaction of relations in the "population-production-ecological environment" system includes the grouping of indicators proposed by L.I.Mukhina and T.G.Runova<sup>1</sup>:

**Group 1** - indicators describing the current and prospective state of the studied parameters of natural, social, and economic subsystems.

**Group 2** - indicators used as a comparison to determine changes in subsystems. They form two subtypes: an indicator reflecting the initial state of subsystems and a conditional "standard". It is preferable to use them in evaluation studies because on the basis of normative indicators it is possible to more accurately express the negative level of consequences that occur in subsystems.

Such a system of indicators primarily includes environmental quality standards represented by FAR norms for pollutants in the air, water, soil, and food products.

$$X_0 = C_0 / FAR_0;$$

There is  $C_0$  – the concentration of the selected substance;  $FAR_0$  - the amount of the substance in the permissible standard concentration in the area.

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<sup>1</sup> Мухина Л.И., Преображенский В. С, Ретеем Л. Ю. География, техника, проектирование//Новое в жизни, науке, технике. Сер. Наука о Земле. № 5. М

In some years, we can witness that the air pollution with nitrogen dioxide (NO<sub>2</sub>) in Navoi city exceeds the permissible norm.

These indicators can help us to develop the Maximum Allowable Rate (MAR) to avoid negative consequences in the regions. The difficulty of developing quantitative and qualitative indicators of FAR and MAR may depend on the nature of their specific area, the conditions of a specific region, the combination of natural conditions, the structure of the economy, the characteristics of the residential system, etc. Although the implementation of such normative indicators is important, they cannot be fully relied on for the following reasons:

- 1) development of these indicators for a small number of components of nature;
- 2) the high dependence of standards on the level of socioeconomic development of society means that they change over time;
- 3) the impossibility and inappropriateness of developing standards for all aspects of social, economic, and natural systems.

The calculation of the concentration of pollutants is carried out by the enterprise using the gross amount of harmful substances, and their total indicators in the settlement.

**Group 3** - indicators of trends and levels of change of systems, which are achieved by forecasting the current state of systems compared to the past and future. These characteristics do not say much about the comfort or discomfort of the changes taking place for humanity, so a stage of real assessment of the consequences from the social and economic point of view is necessary.

**Group 4** - should reflect the assessment of negative consequences:

- on the level of discomfort of changes in nature for bioecological living organisms;
- according to the level of demoecological-inconvenience for the population;
- techno-ecological - natural resources and conditions, on the level of inconvenience for economic activity.

It consists of evaluating changes in the environment according to the criterion of public health from a social point of view and evaluating changes affecting the preservation of biological diversity and gene pool from a bio-ecological point of view, which ensures the stability of biosystems. These non-economic evaluation indicators can be in the form of scores, categories, or pollution levels.

Many researchers have different approaches to the economic assessment of the state of the environment. For example, Mints and Preobrazhensky (1985) estimate the economic damage caused by environmental pollution or depletion of a particular type of resource; Runova (1985) the value of measures to maintain the state of the environment and natural complexes at the same level; Bronfman (1980) understands the environment to overcome the consequences of impacts that outweigh its potential for self-cleansing and restoration. Since it is very difficult not only to take into account all the relations between nature and society but also to express them in the form of values, most of the literature on this topic is theoretical in nature. In practice, a combination of economic and non-economic evaluation is especially necessary today.

**Conclusion.** A comprehensive assessment of the ecological situation is carried out with the help of informational and methodological approaches of extensive research of natural components, factors, and types of influence. The use of information on components is one of the main methods of the comprehensive assessment of the state of the environment. For this, it is necessary to obtain integral indicators based on the convolution<sup>2</sup> of individual components. This process is very complex because it is necessary to take into account the abundance and diversity of industrial and production data.

Comprehensive assessment of regional systems plays a role in the formation of conditions for the specific type of use of their separate elements, groups, and their individual parts. At the same time, different combinations of the same elements (natural, infrastructure, etc.) are analyzed. A comprehensive assessment of the urban environment may include:

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<sup>2</sup> The process of transition of substances from one state to another is understood

- a) evaluation of the urban environment by functional areas (residential, production, recreation);
- b) assessment of industry diversity of industrial enterprises and their location in relation to residential areas;
- k) assessment of the development and quality of social infrastructure systems;
- d) assessment of sanitary and environmental conditions (the comfort of natural conditions and level of anthropogenic impact on the natural environment, level of pollution of the natural environment, indicators of public health, etc.)<sup>3</sup>.

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<sup>3</sup> A B Sukhovееva 2019 *IOP Conf. Ser.: Earth Environ. Sci.* **381** 012087

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